REMARKS/ARGUMENTS

In an office action mailed February 13, 2004 (paper no. 5), the specification was objected to based on the title and use of trademarks. Claims 10-12 were rejected under 35 U.S.C. 102(b) as being anticipated by ***Krymski et al.*** Claims 1-7, 13-15, 19 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over ***Vilella*** in view of ***Krymski et al.*** Claims 8, 9 and 16-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over ***Vilella*** in view of ***Krymski et al.*** and further in view of ***Clark et al.*** These rejections are respectfully traversed.

Objections to the Specification

The specification stands objected to as having a title that is not descriptive, and for alleged use of trademarks. These objections are respectfully traversed. The title of the application may be changed by Examiner's amendment after allowance of the claims if the Examiner believes that it is not descriptive. In regards to the alleged use of trademarks, Applicants believe that any trademark usage is in accordance with MPEP 608.01(v), but if there are specific instances of which the Examiner is aware that require additional modification, Applicants will do so after allowance of the claims.

Rejection of claims under 35 USC 102

Claims 10-12 were rejected under 35 U.S.C. 102(b) as being anticipated by Krymski. In particular, it is alleged that Krymski discloses "a controller coupled to the CMOS active pixel sensor, the controller receiving the pixel data and generating pixel line data" at Figure 1 and page 2, paragraph 3 of Krymski. This rejection is respectfully traversed.

Krymski fails to provide a basis for the rejection of claims 10-12 under 35 U.S.C. 102(b), because it fails to disclose each element of the claimed invention. In particular, it is noted that Krymski fails to disclose "a controller coupled to the CMOS active pixel sensor, the controller receiving the pixel data and generating pixel line data" at Figure 1 and page 2, paragraph 3. In particular, Krymski states at page 2, paragraph 3 that the "sensor has an on-chip digital block, which runs the row processing, ADC conversion, and readout. It allows flexibility in selecting rows and columns as well as defining the start time for row processing or read." Note that the cited section does not include the word "line," nor is the word "line" used anywhere in Krymski

In fact, the ordinary meaning of the word "line" relative to a "frame" of image data is simply not disclosed or discussed in Krymski. Likewise, while the on-chip digital block allows flexibility in selecting rows and columns as well as defining the start time for row processing or read, it does not include any functionality that selects the rows and columns, nor any functionality that defines the start time for row processing or read – the sensor of Krymski must receive those signals from off-chip. Put another way, while Krymski discloses that the sensor was run at different speeds ranging from 15 f/s to 574 f/s, it does not disclose that the on-chip digital block has variable timing circuitry that would allow the speed to be controlled entirely on-chip – the timing circuitry must come from an external controller.

Likewise, Krymski discloses that the number of outputs is 64, or 8 x 8 bit. Without external registers to store the pixel sensor data, index the start of each line, and track the data line by line and frame by frame, the data output from the pixel sensor of Krymski would not be distinguishable as line data. Likewise, Krymski discloses that the "data are demultiplexed so that columns 1, 3, 5, 7 in the bottom and 2, 4, 6, 8 at the top go to separate pads." Again, without an external controller, assembling the data from the 64 outputs of the pixel sensor of Krymski into pixel line data simply cannot be accomplished.

In contrast, the generation of line data from a CMOS active pixel sensor is discussed in detail in the specification, such as from page 10, line 10 to page 11, line 11. For example, it is disclosed starting at page 10, line 10 that the "output clock input to CMOS imaging sensor 106 controls the timing operation of components of CMOS imaging sensor 106, and is used to coordinate the operation of CMOS imaging sensor 106 with controller 108. The start analog to digital conversion control data is used to initiate the operation of an on-chip 8 bit column parallel analog to digital conversion system or other suitable systems. The line shift control data causes the generation of each line of pixel data to be initiated, and the line shift enable control data causes CMOS imaging sensor 106 to start generation and output of the pixel data over the 64 bit parallel data bus." Clearly, exemplary controller 108 is not the on-chip 8 bit column parallel analog to digital conversion system, which is also disclosed in Krymski at Table 1, as the pixel sensor of Krymski is unable to receive the pixel data and generate pixel line data without external control. In the same manner, claim 10 includes a controller "coupled to the CMOS active pixel

sensor, the controller receiving the pixel data and generating pixel line data." The controller of claim 10 must be something other than the on-chip digital block of the pixel sensor Krymski.

Claim 11 includes that "the controller further comprises a pixel shift system initiating a pixel readout sequence to start at a pixel series position." The Examiner points broadly to pages 1 and 2 of the two-page Krymski reference, but the cited section does not include any discussion of a pixel shift system that initiates a pixel readout sequence to start at a pixel series position. Instead, it discusses the on-chip analog to digital converter, an SRAM structure, and high speed differential sense amplifiers Again, in order to initiate a pixel readout sequence to start at a pixel series position, it is necessary to use registers and other systems to track the sequence of pixels as they are read out from the pixel sensor and to provide a control signal to cause the pixel sensor to initiate the pixel readout sequence, as well as a clock signal. Krymski simply fails to disclose anything remotely related to a pixel shift system initiating a pixel readout sequence to start at a pixel series position.

Claim 12 includes "a framing system generating frames of image data at a rate greater than one frame every 30 milliseconds." The Examiner alleges that such a system is disclosed by Krymski, but in fact, the only mention made of framing by Krymski is that the sensor has been run at various speeds that are expressed in units of frames per second. However, as noted in the specification at page 7, lines 24-25, the present invention "eliminates the need for using expensive frame grabbers." Perhaps the frames mentioned in Krymski were generated using such expensive frame grabbers? It cannot be determined, though, because no structure beyond the pixel sensor is disclosed in Krymski. If claims 10-12 are being rejected over the combination of Krymski with a frame grabber circuit, then not only is that a rejection under 35 U.S.C. 103 and not 35 U.S.C. 102, but the Applicants should have the benefit of having that art cited against the claims so that distinctions between the claimed invention and such a combination can be made, or so that the claims can be amended to distinguish over the prior art. As Krymski only discloses a CMOS active pixel sensor, a single element of claim 10, and fails to disclose the remaining elements of claims 10 through 12, the rejection under 35 U.S.C. 102 should be withdrawn.

Rejection of claims under 35 USC 103

Claims 1-7, 13-15, 19 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over ***Vilellu*** in view of ***Krymski et al.*** These rejections are respectfully traversed.

Vilella in view of Krymski and Vilella in view of Krymski and Clark fail to provide a prima facie basis for the rejection of claims 1-9 and 13-20, as they fail to disclose each element of the claimed invention. For example, claim 1 includes "a CMOS imaging system generating image data; an image analysis system coupled to the CMOS imaging device, the image analysis system receiving the image data and generating image analysis data; and wherein the CMOS imaging system generates the image data at a rate that allows the CMOS imaging device to be used for inspecting components in response to line shift control data received from the image analysis system." Claim 13 includes a "method for generating image data of a component for use in inspecting the component comprising: generating pixel data using a CMOS imaging system; transferring the pixel data as a plurality of pixel lines; assembling the pixel lines into a frame; and wherein the frame is assembled in less than 30 milliseconds." As previously discussed, Krymski fails to disclose line control data of any sort, much less line shift control data. Likewise, Vilella also fails to disclose any kind of line control data. As such , Krymski in view of Vilella fails to disclose each element of the invention of claim 1.

Claims 8, 9 and 16-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over ***Vilella*** in view of ***Krymski et al.*** and further in view of ***Clark et al.*** These rejections are respectfully traversed. Claim 8 includes "the CMOS imaging sensor further comprises a pixel shift system that enables a readout sequence to start at a pixel series position that reduces noise and improves signal quality," and claim 9 includes that "the pixel shift system enables the readout sequence to start at a fifth pixel series position." The Examiner states that "Clark et al. teaches the use of a rolling shutter system which starts readout at a predetermined position, that can be used for reading out partial frames or specific areas of interest," and further asserts that "by only reading out a small area of the array, less noise will be read out." However, this assertion not only adds disclosure that is missing from Clark (i.e., that the ***reason*** for using the rolling shutter system is to reduce noise, something that Clark entirely fails to disclose), it is incorrect as a matter of claim construction. There are no "rolling shutter," "partial frame" or "area of interest" limitations in claim 8. Clark simply fails to disclose that by starting the readout at a certain pixel series position, noise can be reduced. While noise ***may*** be reduced by reading out a "small area of the array" (and the Applicants hereby challenge that assertion as provided

under MPEP 2144.03), nothing in claim 8 refers to starting the pixel readout so as to reduce the use of the array to a small area. Indeed, claim 9 states that "the pixel shift system enables the readout sequence to start at a fifth pixel series position" – for a 1024 x 1024 array as disclosed in the specification and in the cited art, omitting 4 pixels of each line reduces the array by approximately 0.4 ***percent***. The Applicants desire to understand how the Examiner can substantiate that a reduction in the size of the array to 99.6 percent of its original size constitutes "reading out a small area of the array," or that starting the readout at a certain pixel series position can be used to reduce the array to a small area while still allowing the array to be used for component inspection – for example, if the "small area" must be 10% of the array, the Applicants dispute that reducing a 1024 x 1024 pixel sensor array to a 102 x 1024 array would generate data that could be used for component inspection.

It is further noted that Clark discloses at column 1, lines 47-56 that "[e]lectronic image sensors, not unlike conventional film, have a certain exposure range; if the exposure time is too short, almost no charge is drained from the reverse-biased junction, resulting in a very small voltage drop which is difficult to measure and consequently results in a large noise-to-signal ratio; if the exposure time is too long, almost all charge will be drained for the majority of pixels, thereby providing little image content or image contrast. It is therefore important to provide shutter means for limiting the exposure of the pixels to incoming radiation." Thus, the "rolling shutter" of Clark is not even being used to select an area of interest, but rather to control the exposure time of all of the pixels in the array so as to prevent a loss of the data content of the entire array.

Likewise, claim 16 includes "generating a reset command; initiating a pixel line at the next clock cycle after the reset command; waiting a predetermined number of clock cycles to generate a next pixel line; and wherein the predetermined number of clock cycles is less than 208 clock cycles." The Examiner again cites the broad, general disclosure of a rolling shutter system, but claim 16 is not directed to a rolling shutter system that is used to select areas of interest or to prevent overexposure of the pixels, but rather to "waiting a predetermined number of clock cycles to generate a next pixel line; and wherein the predetermined number of clock cycles is less than 208 clock cycles." Clark simply fails to disclose waiting a predetermined number of clock cycles to generate a next pixel line. While some clock cycles may pass in the system of Clark

before a line is generated, the number of clock cycles is not predetermined but rather variable and based on the "rolling shutter," so as to prevent overexposure of pixels.

Accordingly, withdrawal of all rejections and allowance of the claims is respectfully requested.

CONCLUSION

In view of the foregoing remarks and for various other reasons readily apparent, Applicants submit that all of the claims now present are allowable, and withdrawal of the rejections and a Notice of Allowance are courteously solicited.

If any impediment to the allowance of the claims remains after consideration of this amendment, a telephone interview with the undersigned at (214) 969-4669 is hereby requested so that such impediments may be resolved as expeditiously as possible.

An extension of one-month is believed to be due with this response, and a petition therefore is hereby made. The Commissioner is hereby authorized to charge the deposit account of Akin, Gump, Strauss, Hauer & Feld, L.L.P., No. 01-0657 in the amount of $110 for the associated extension fee. No additional fee is believed to be required with this response. If any applicable fee or refund has been overlooked, the Commissioner is hereby authorized to charge any fee or credit any refund to the deposit account of Akin, Gump, Strauss, Hauer & Feld, L.L.P., No. 01-0657.

Respectfully submitted,

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